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GB 0519816 A EP 0081850 A2 US 4458364 A

(58) Field of search
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(54) Weather resistant outdoor garment

(57) The garment (10), especially for arduous weather conditions, in the form of a jacket or coat and/or a pair of trousers (not shown), comprises an outer liner (11), an inner liner (12), and an intermediate layer of fleece (13) arranged between the inner liner (12) and the outer liner (11). The inner liner (12) is made of a waterproof and breathable fabric to allow wearer-generated moisture to pass outwardly through the inner liner; the outer liner (11) is made of a fabric which is resistant to wind but is pervious to water; and the intermediate layer of fleece (13) is freely suspended within the space defined between outer liner (11) and inner liner (12). The arrangement is such that wearer-generate moisture e.g. from the body, arms and / or legs of the wearer passes outwardly through the inner liner to the layer of fleece and tends to repel any water on the fleece which has passed inwardly through the outer liner to the fleece. The outer liner may be removable and worn on its own in moderate weather conditions, or the remainder of the garment may be worn instead as a heavier duty jacket when its colder but not wet.

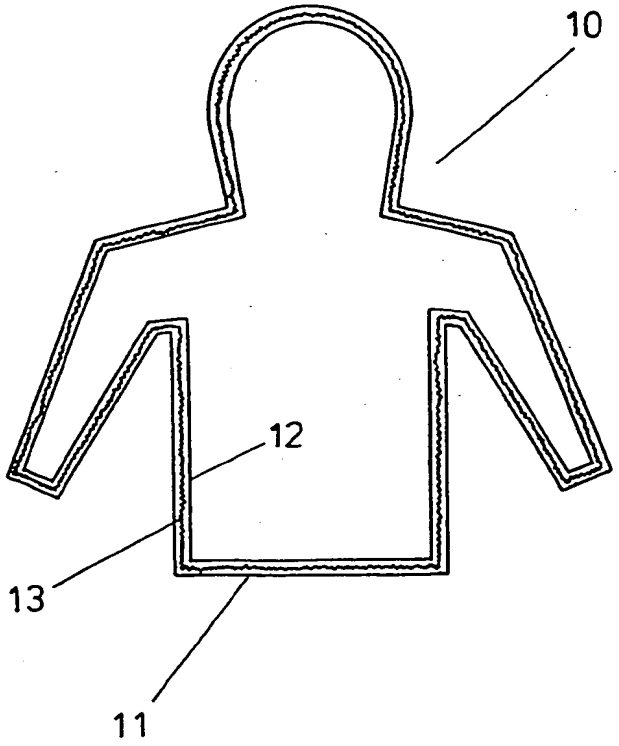

FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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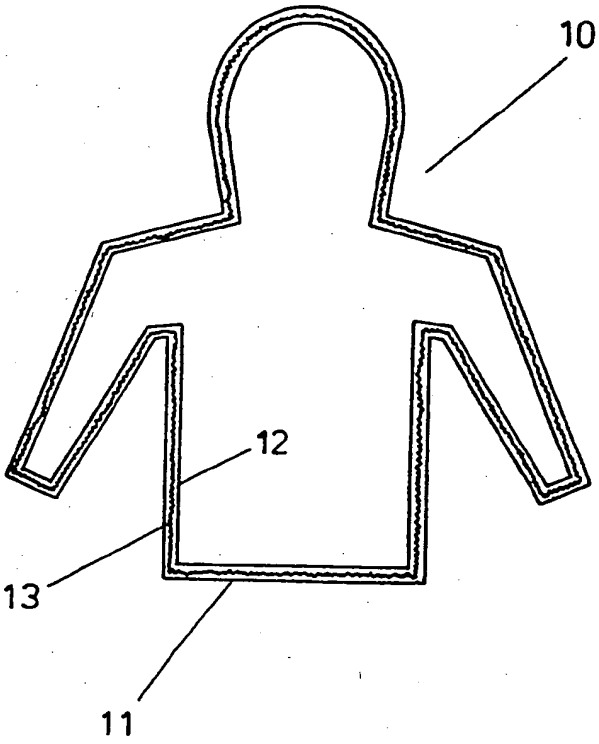

FIG. 1

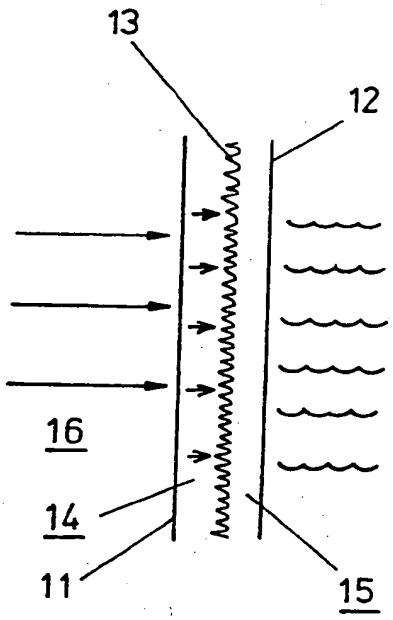

FIG. 3

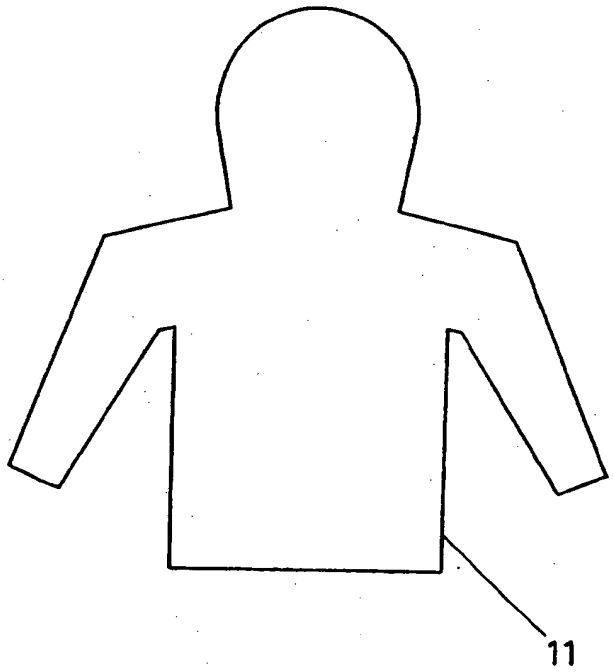

FIG. 2

WEATHER RESISTANT OUTER GARMENT

This invention relates to a weather resistant outer garment, and has been developed primarily, though not exclusively, in connection with a jacket or coat type garment to be worn over at least the upper body and arms of the user.

Anoraks, cagoules and "oil-skins" are used by hill walkers, ramblers, sailors and others who are exposed to adverse weather, and in order to shield the wearer from the worst of wind and rain.

However, anoraks or "windcheater" type garments are generally not fully waterproof, and therefore only provide protection against damp conditions or rainfall of short duration, although having the advantage of being relatively lightweight and also being "breathable" in the sense of allowing body-generated moisture of the wearer to pass into the garment. Therefore, garments of this nature are unsuitable for use in conditions in which the wearer may be exposed to prolonged action of rain and wind, as the garment eventually becomes fully impregnated with rain and no longer functions to shield the wearer from cold and wet, with evident risk to the health and safety of the wearer.

Therefore, when exposure to arduous conditions are anticipated e.g. hill walking or mountaineering, it is advisable to wear garments which have greater resistance to absorbtion of rain, or which in fact have an external surface which is totally water repellant. Oil-skins are an example of substantially water repellant garments, but have the disadvantage of being awkward to wear and to move in, being less flexible than other garments, and also causing the wearer to become very "sweaty" by reason of the fact that body-generated moisture is not readily able to escape since oil skins do not have any appreciable "breathable" properties.

There is therefore a need to provide a jacket type garment having the following properties: fairly easy to wear and retain body warmth; resistant to wind to protect the

wearer from the "wind chill factor"; has some properties of "breathability" to allow body-generated moisture to escape into the garment for wearer comfort; and does not allow rain impinging on the outer surface of the garment to pass through the garment and into contact with the wearer.

The invention addresses this need by providing a garment made of a number of separate layers of fabric, of which an intermediate layer is made of a fleece to retain body warmth, and which has a novel combination of innermost and outermost layers with said intermediate layer to meet the requirements as set out above.

Furthermore, while the invention is particularly suitable for use in connection with an outdoor garment to be worn over the arms and at least the upper body of the wearer, it should be understood that the invention may also be applicable to trousers, either alone or in combination with the upper body garment.

According to one aspect of the invention there is provided an outdoor garment to be worn over the arms and at least the upper body of the wearer, and which comprises:

an outer liner, an inner liner, and an intermediate layer of fleece arranged between the inner and outer liners; in which:

the inner liner is made of a waterproof and breathable fabric to allow body-generated moisture to pass outwardly through the inner liner;

the outer liner is made of a fabric which is resistant to wind but is pervious to water; and,

the intermediate layer of fleece is arranged within the space defined between the inner and outer liners to define air spaces between each side of the fleece and the adjacent liner, the arrangement being such that in use body-generated moisture passes outwardly through the inner liner to the layer of fleece and tends to repel any water on the fleece which has passed inwardly through the outer liner to the fleece.

A garment according to the invention therefore is easy

to wear, in that it does not have an outer layer which is substantially impervious to water (and therefore necessarily less flexible than pervious fabrics), and which retains body warmth by reason of the intermediate fleece layer and allows escape of body moisture via the breathable inner layer, and which relies upon the action of the fleece to repel any rainwater which penetrates the outer layer and avoids water coming into contact with the wearer. However, while the outer liner is pervious to water, it is preferably made to be "showerproof", and may be re-treated from time to time when required.

The action of the fleece in fact simulates the action which occurs naturally with animals having a fleece, such as a sheep, in which rainwater on the fleece tends to be repelled from coming into contact with the skin of the sheep.

The outer liner may fit loosely over the inner liner and intermediate fleece layer, and when rainwater accumulates on the fleece (after migrating through the outer liner), this rainwater will be repelled by the body-generated water vapour which passes through the inner liner to the fleece, and the rainwater can be shed by shaking of the garment, rather in the way in which a sheep shakes off rainwater from its fleecy coat.

Preferably, the intermediate fleece layer is freely suspended within the space between the inner and outer layers in a way which minimises contact between the fleece layer and the liners, and this may be achieved by securing the edges only of the fleece layer to the inner liner by any suitable means, such as tapes.

In a preferred arrangement, the outer liner comprises a removable outer jacket which can be worn on its own in moderate weather conditions in the manner of a lightweight windcheater e.g. during hill walking at lower levels. The remaining part of the garment, namely the intermediate fleece layer and the inner liner also then form a separate, heavier duty jacket which can be worn when conditions are colder, but not wet, so that the wearer can retain a greater proportion

of body warmth. Finally, in more arduous conditions, the outer liner can be reassembled with the fleece and inner liner, and the garment then provides wind resistance by reason of the outer liner, and resistance to water ingress into contact with the wearer by the combined action of the inner liner and fleece as referred to above.

The fleece may be manufactured in any convenient form, and may be derived from natural or synthetic materials.

The outer liner is preferably made from micro-fibre fabric, which is wind resistant, and when assembled with the intermediate fleece layer and inner liner, is able to break-up the weather pattern before it hits the undergarment. The outer liner is not waterproof, but is able to reduce the amount of water reaching the fleece of the undergarment.

A garment according to the invention may be used by hill walkers and mountaineers, or others engaged in outside activities, but also can be used to advantage at sea. The wearer is able to stay dryer, more comfortable, and to be subjected to less bulk than when wearing oil-skins, which have the disadvantages referred to above.

In a preferred arrangement, the garment also includes an attached pair of trousers, similarly provided with an outer liner, an inner liner and an intermediate layer of fleece.

According to a further aspect of the invention there is provided an outdoor garment which comprises:

an outer liner, an inner liner, and an intermediate layer of fleece arranged between the inner and outer liners;

in which:

the inner liner is made of a waterproof and breathable fabric to allow wearer-generated moisture to pass outwardly through the inner liner;

the outer liner is made of a fabric which is resistant to wind but is pervious to water; and,

the intermediate layer of fleece is arranged within the space defined between the inner and outer liners to define air spaces between each side of the fleece and the adjacent

liner, the arrangement being such that in use wearer-generated moisture passes outwardly through the inner liner to the layer of fleece and tends to repel any water on the fleece which has passed inwardly through the outer liner to the fleece.

One embodiment of weather resistant outer garment according to the invention will now be described in detail, by way of example only, with reference to the accompanying schematic drawing, in which:

Figure 1 is a schematic front view of a multi-layer garment according to the invention, having an outer liner, an inner liner and an intermediate layer of fleece between the two liners;

Figure 2 is a schematic front view of the outer liner, which is removable from the garment; and,

Figure 3 is a schematic sectional illustration of the three layers of fabric from which the garment is made.

Referring now to the drawings, an outdoor garment according to the invention is designated generally by reference 10, and is a jacket or coat type garment to be worn over the arms and at least the upper body of the wearer. The garment 10 comprises an outer liner 11, an inner liner 12, and an intermediate layer of fleece 13 arranged between the inner liner 12 and outer liner 11.

The inner liner is waterproof and breathable and comprises a membrane made of a breathable fabric to allow body-generated moisture to pass outwardly through liner 12 and towards the fleece layer 13 (under the action of differential vapour pressure i.e. the greater vapour pressure usually prevailing within the inner liner as compared to the vapour pressure in the space between the inner and outer liners). The outer liner 11 is made of a fabric which is resistant to wind, but is pervious to water. Outer liner 11 comprises an outer separate jacket or smock made from micro-fibre fabric, and this can be worn separately as a windcheater (preferably treated to be showerproof), as shown in Figure 2, when it is removed from the garment.

The intermediate layer 13 is freely suspended within the space defined between outer liner 11 and inner liner 12, and defines air spaces 14 and 15 between each side of fleece layer 13 and the adjacent liners 11, 12. The arrangement is such that, in use, body-generated moisture passes outwardly through the inner liner 12 and comes into contact with the fleece layer 13, whereas wind-borne rain 16 impinging on the outer liner 11 can result in some water passing through outer liner 11 inwardly towards the fleece 13. The micro-fibre nature of the fabric from which outer liner 11 is made serves to dispel wind, and at least some of the rainwater, but any rainwater which does penetrate the outer liner 11 and moves towards the fleece layer 13 is repelled by the outwardly moving body-generated moisture. Body-generated moisture takes the form of vapour, which tends to push back the water droplets which may become attached to the fleece, and this prevents the rainwater from coming into contact with the wearer.

Garment 10 is therefore easy to wear, in that the outer liner 11 is flexible, as it is only required to carry out a wind dissipation function, whereas intermediate fleece layer 13 is able to retain body warmth, and inner liner 12 allows escape of body-generated moisture in view of its "breathable" properties, which add to the comfort of wearing the garment.

The combined action of the fleece 13 and inner liner 12 to repel any rainwater which penetrates the outer liner 11 avoids such water coming into contact with the wearer.

The intermediate fleece layer 13 is freely suspended within the space between inner liner 12 and outer liner 11 in a way such as to minimise contact between the fleece layer and the liners, and this can be achieved by securing the edges of the fleece layer 13 to the inner liner 12 by any suitable means, such as tapes.

As can be seen in Figure 2, and as referred to above, outer liner 11 comprises a removable outer jacket, which can be worn on its own in moderate weather conditions, and the remaining part of the garment, namely intermediate fleece

layer 13 and inner liner 12 also then form a separate, heavier duty jacket which can be worn when conditions are colder. However, in arduous conditions of wind and rain, the garment is reassembled, and then provides both wind resistance by reason of outer liner 11, and resistance to water ingress into contact with the wearer by the combined action of inner liner 12 and fleece layer 13.

Garment 10 may be used by hill walkers and mountaineers, and other persons engaged in outside activities. It is also suitable for use on boats, and will be less bulky than use of oil-skins.

While the outer garment described above with reference to the drawing is intended to be worn over the arms and at least the upper body of the wearer, it should be understood that the invention is also applicable to a pair of trousers, either alone or in combination with the upper body garment. In either event, the pair of trousers will be provided with an outer liner, and inner liner and an intermediate layer of fleece arranged between the inner and outer liners, in which: the inner liner is made of a waterproof and breathable fabric to allow wearer-generated moisture to pass outwardly through the inner liner; the outer liner is made of a fabric which is resistant to wind but is pervious to water; and the intermediate layer of fleece is arranged within the space defined between the inner and outer liners to define air spaces between each side of the fleece and the adjacent liner, the arrangement being such that in use wearer-generated moisture e.g. from the body, arms and / or legs of the wearer passes outwardly through the inner liner to the layer of fleece and tends to repel any water on the fleece which has passed inwardly through the outer liner to the fleece.

CLAIMS

1. An outdoor garment to be worn over the arms and at least the upper body of the wearer, and which comprises:

an outer liner, an inner liner, and an intermediate layer of fleece arranged between the inner and outer liners;

in which:

the inner liner is made of a waterproof and breathable fabric to allow body-generated moisture to pass outwardly through the inner liner;

the outer liner is made of a fabric which is resistant to wind but is pervious to water; and,

the intermediate layer of fleece is arranged within the space defined between the inner and outer liners to define air spaces between each side of the fleece and the adjacent liner, the arrangement being such that in use body-generated moisture passes outwardly through the inner liner to the layer of fleece and tends to repel any water on the fleece which has passed inwardly through the outer liner to the fleece.

2. A garment according to claim 1, in which the intermediate fleece layer is freely suspended within the space between the inner and outer layers.

3. A garment according to claim 2, in which the intermediate fleece layer is secured along its edges to the inner layer.

4. A garment according to any one of claims 1 to 3, in which the outer liner comprises a removable outer jacket, and intermediate fleece layer and the inner liner comprises separate heavier duty jacket which can be worn on its own.

5. A garment according to any one of claims 1 to 4, in which the outer liner is made from micro-fibre fabric.

6. A garment according to any one of claims 1 to 5, including an attached pair of trousers, similarly provided with an outer liner, an inner liner and an intermediate layer of fleece.

7. An outdoor garment which comprises:

an outer liner, an inner liner, and an intermediate layer of fleece arranged between the inner and outer liners;

in which:

the inner liner is made of a waterproof and breathable fabric to allow wearer-generated moisture to pass outwardly through the inner liner;

the outer liner is made of a fabric which is resistant to wind but is pervious to water; and,

the intermediate layer of fleece is arranged within the space defined between the inner and outer liners to define air spaces between each side of the fleece and the adjacent liner, the arrangement being such that in use wearer-generated moisture passes outwardly through the inner liner to the layer of fleece and tends to repel any water on the fleece which has passed inwardly through the outer liner to the fleece.

8. A garment according to claim 1 and substantially as hereinbefore described with reference to, and as shown in the accompanying drawing.

9. A garment according to claim 7 and substantially as hereinbefore described.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

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GB 9300569.2

Relevant Technical fields

(i) UK Cl (Edition L) A3V B5N

(ii) Int Cl (Edition 5) A41D 1/00 1/02 1/06 1/08 3/04 13/00 13/04
B32B 5/26

Search Examiner
D BUCKLEY

Databases (see over)
(i) UK Patent Office

(ii)

Date of Search
19 MARCH 1993

Documents considered relevant following a search in respect of claims 1-9

Category (see over)	Identity of document and relevant passages		Relevant to claim(s)
X	GB 519816	(STEWART) lines 35 to 49 and 85 to 89 of page 1	1 and 7
X	EP 0081850 A2	(GORE & CO) lines 15 to 24 of page 4	1, 4 and 7
X	US 4458364	(FENNINGER ET AL) lines 9 to 14 of column 2	1, 2, 3 and 7

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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